

Social Network Analysis & Behavior Change Dynamics

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Organization of Talk

1. Individual influences
2. Network level influences
3. Individual-network interactions
4. Interventions
5. Coalitions, collaboration & exchange

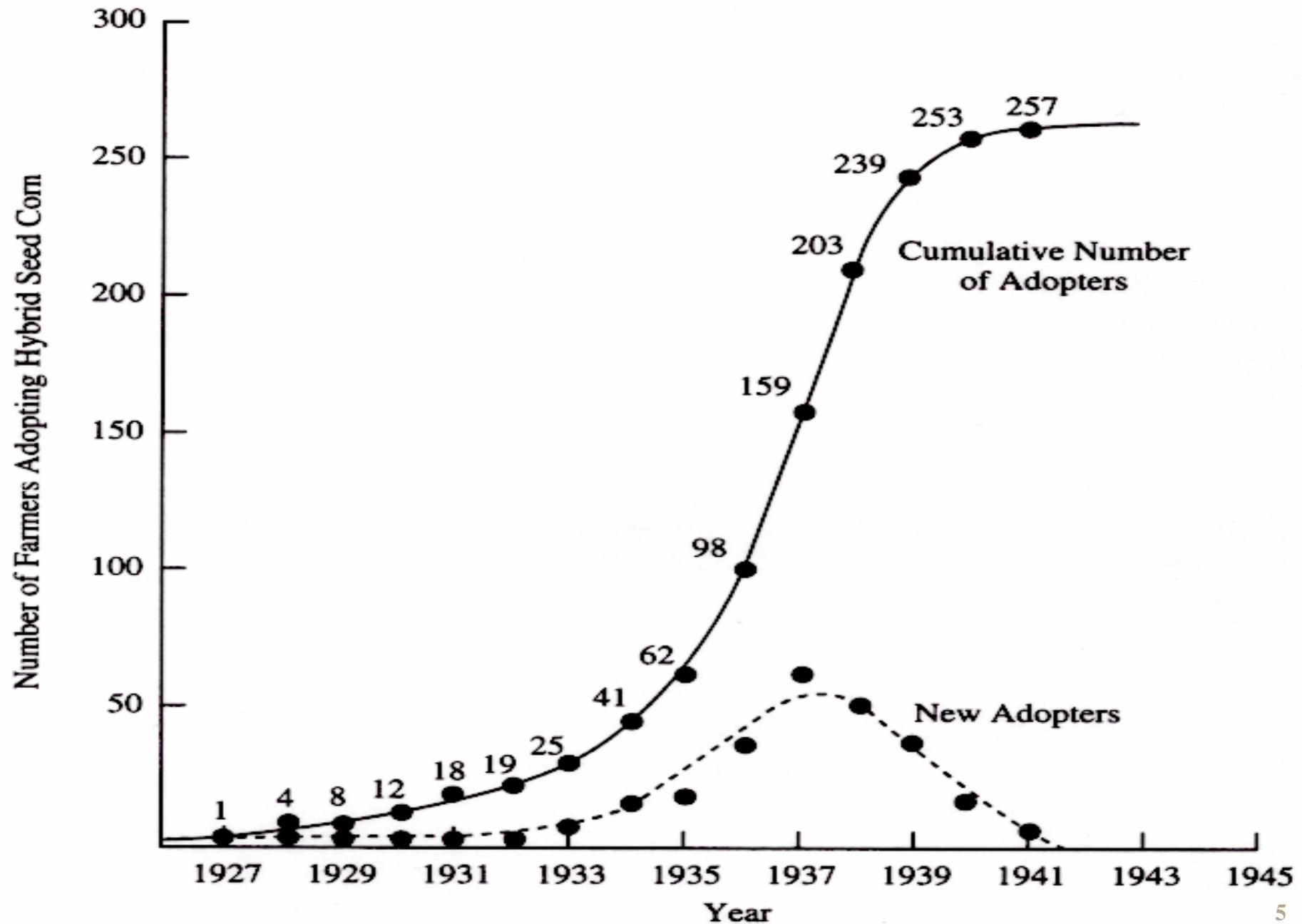
I. Individual Level Effects

- Awareness and information passes thru network contacts
- Detailed knowledge and know-how gets transmitted via networks
- Perceptions of norms, peer pressure flow thru networks

Social Networks Influence Behavior

- Smoking
- Substance abuse
- Family planning & fertility regulation
- Physician practices
- Sexually transmitted infections/ HIV
- Bullying & violence
- Obesity & physical activity

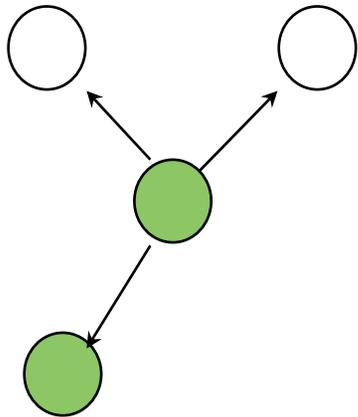
Figure 7-1. The Number of New Adopters Each Year, and the Cumulative Number of Adopters, of Hybrid Seed Corn in Two Iowa Communities



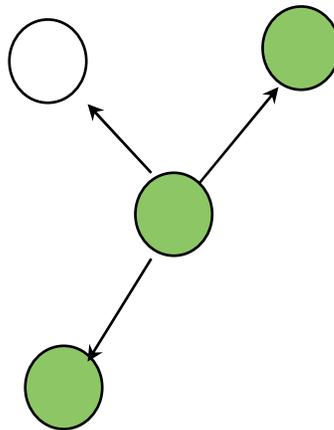
Network Exposure

○ = *Non User*

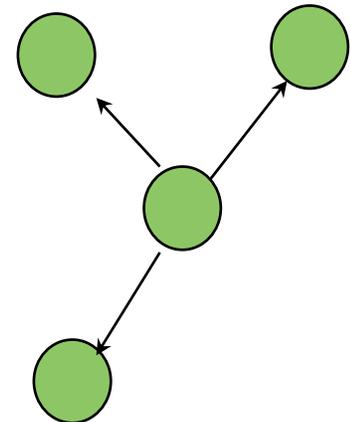
● = *User*



**Network
Exposure=33%**



**Network
Exposure=67%**



**Network
Exposure=100%**

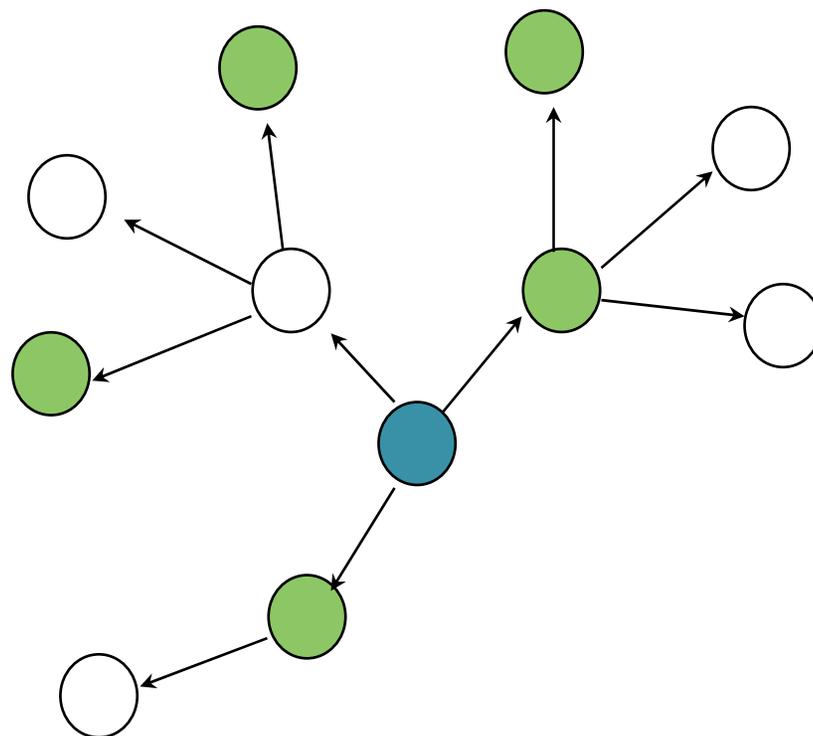
Adjusted Odds Ratios for Contraceptive Use of Women in Voluntary Organizations, Yaoundé Cameroon.

	AOR
Correctly thought friends use	2.5
Correctly thought friends do not use	4.6
Incorrectly thought friends use	1.9
Incorrectly thought friends do not use	0.3
Perceive friends use	1.2
Perceive friends encouraged use	8.7**
**p<0.01 .	
Controls for education, age, income, and age, income, and education of friends	

Personal Network Exposure Weighted by Indirect Ties

○ = *Non User*

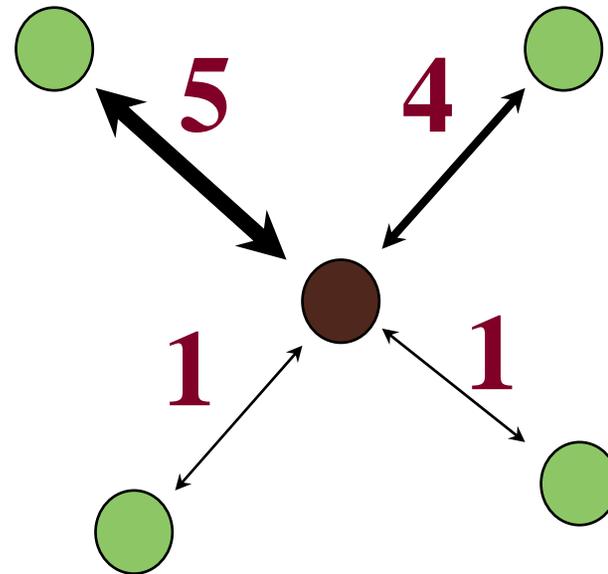
● = *User*



PN Exposure=54%

Personal Network Exposure Weighted by Strength of Tie

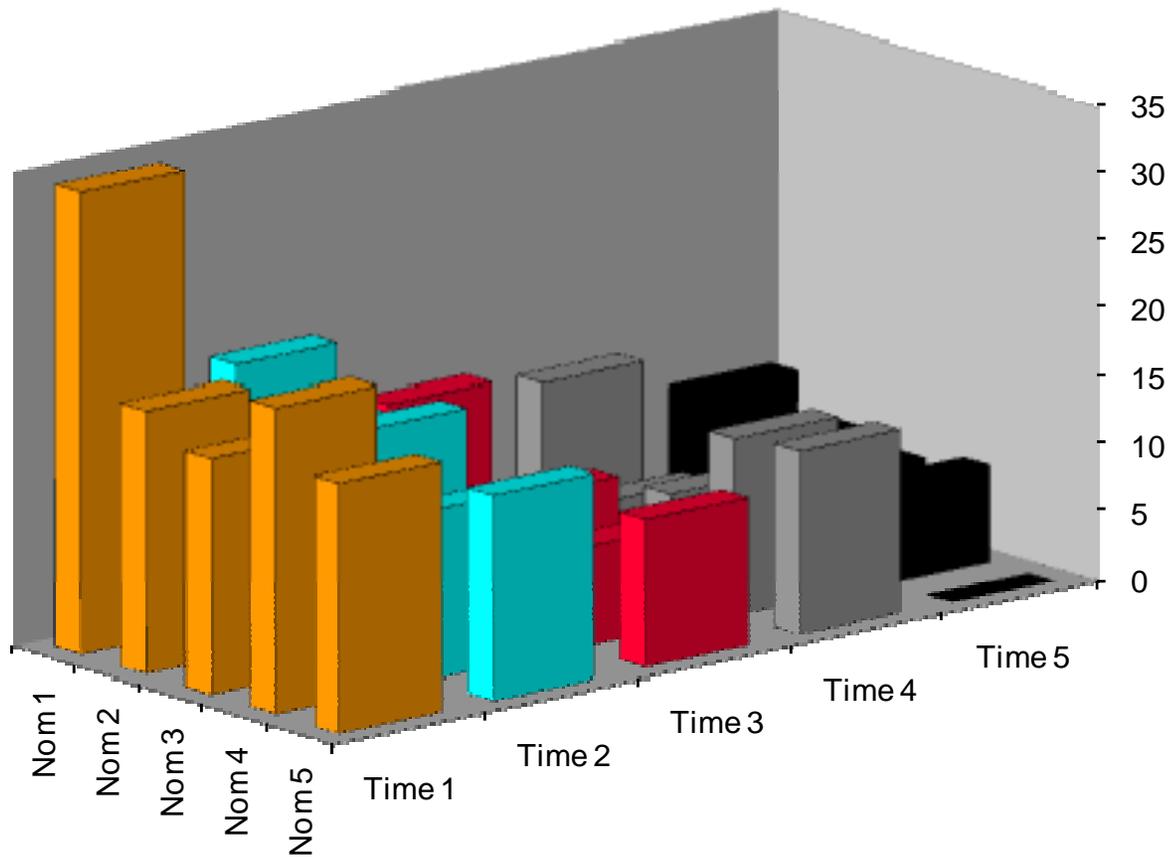
Influence is
Stronger
for Stronger
(Closer)Ties



Baltimore NEP

- Time Period: August 12, 1994 - February 12, 1997
- Repeated interviews with 1,184 respondents at baseline, 2-week, 6-month, 1-year, 18-month
- Included ego-centric questions on survey
- “Provide the initials or nicknames of up to 5 your closest friends”

Graph of reported syringe sharing by friendship rank and survey wave



Adjusted Odds Ratios for Syringe Sharing (N=3,907).

	Shared Syringe			
	Not Recent but w/ This Friend	Recently and w/ This Friend	Recently Not w/ This Friend	Shared w/ Other Friend
Network Size	1.29	0.84	1.90**	3.80**
1 st or 2 nd Named	1.65**	1.52**	0.94	0.69**
Friend Repeated	0.82	1.19	1.21	0.55**
*p<.01; **p<.001				
Controls for sex, age, ethnicity, employment, drug use, sex exchange, survey wave, and length in study.				

Three Studies with Data on Time-of-adoption & Social Networks

	Medical Innovation	Brazilian Farmers	Korean Family Planning
Country	USA	Brazil	Korean
# Respondents	125 Doctors	692 Farmers	1,047 Women
# Communities	4	11	25
Innovation	Tetracycline	Hybrid Corn Seed	Family Planning
Time for Diffusion	18 Months	20 Years	11 Years
Year Data Collected	1955	1966	1973
Ave. Time to 50%	6	16	7
Highest Saturation	89 %	98 %	83 %
Lowest Saturation	81 %	29 %	44 %
Citation	Coleman et al (1966)	Rogers et al (1970)	Rogers & Kincaid (1981)

Regression on Time to Adoption by Network Exposure & External Contacts

	Medical Innovation N=125	Brazilian Farmers N=792	Korean Fam. Planning N=1,025
Science Attitude	0.61*		
Journals	1.16*		
Income		1.01*	
Visits to City		1.00	
# of children			1.10**
Campaign			1.04*
Exposure	0.54	1.31*	1.09
Direct Contacts			

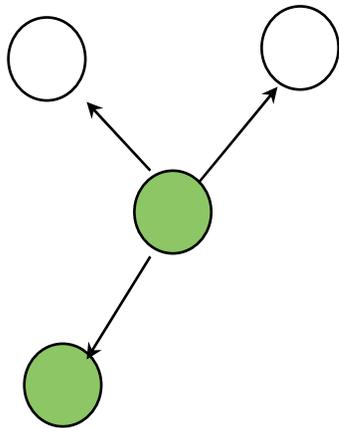
Direct Exposure → Adoption?

- Represents a challenge to the diffusion and other behavior change models.
- Could be a function of location on the diffusion curve – more likely at later stages of diffusion.
- Very disappointing from a behavioral science point of view.

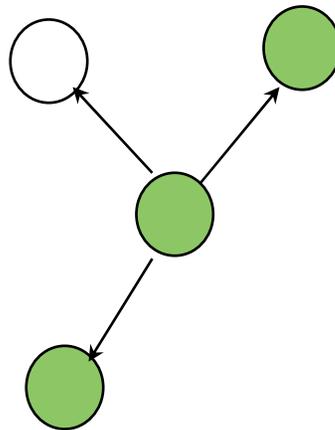
Network Threshold

○ = *Non User*

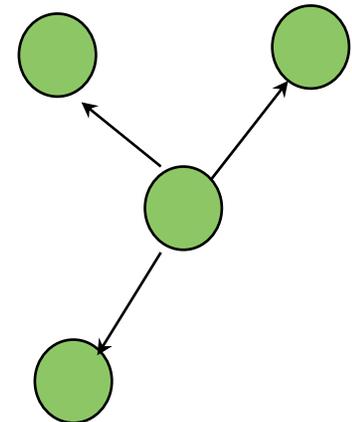
● = *User*



**Network
Threshold=33%**

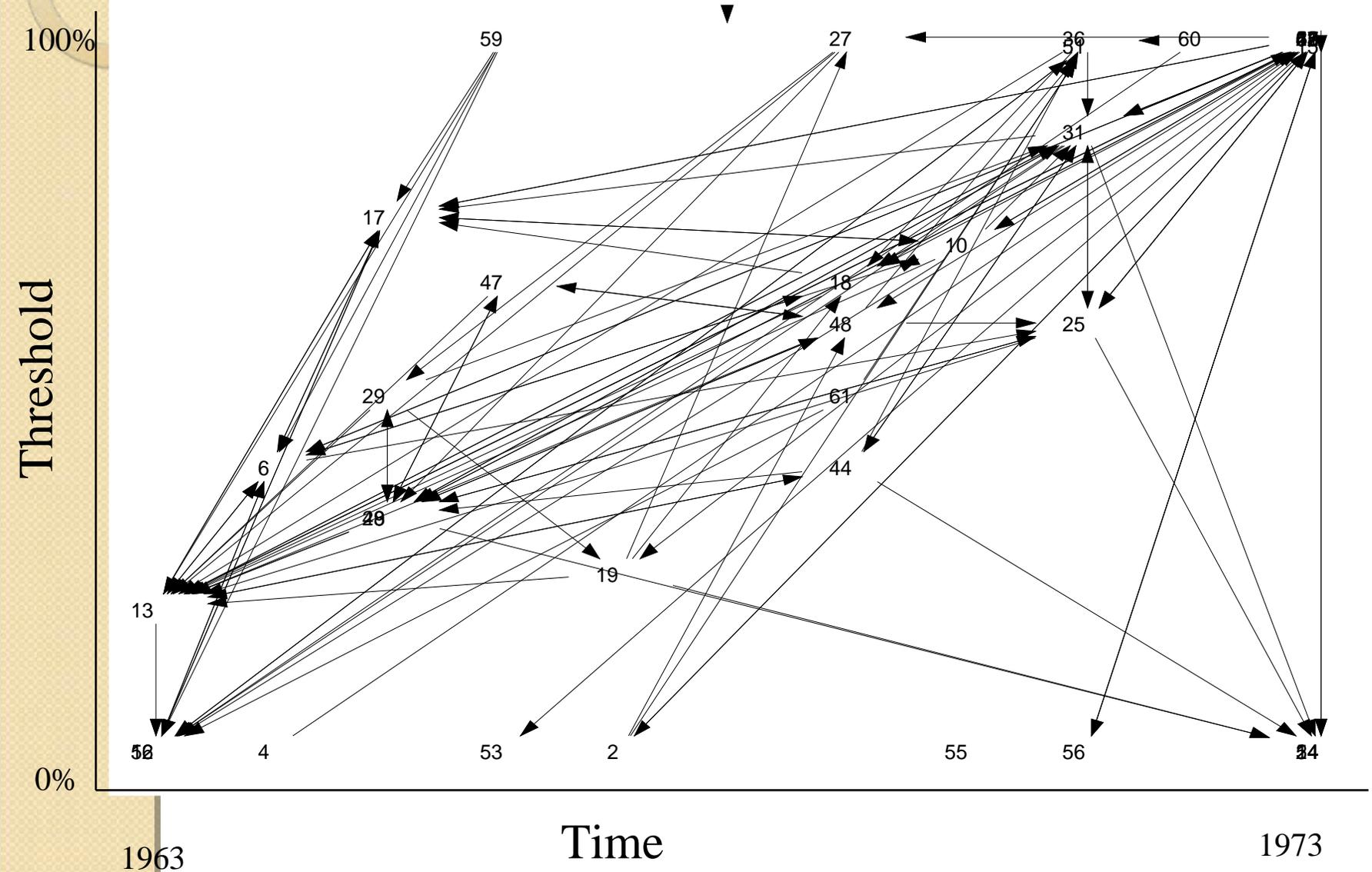


**Network
Threshold=66%**



**Network
Threshold=100%**

Graph of Time of Adoption by Network Threshold for One Korean Family Planning Community



Campaign Exposure and Behavior Change for Low and High-threshold Adoption (AORs).

	Cross-Sectional Data (N=611)		Panel Data (N=141)	
	Low Threshold	High Threshold	Low Threshold	High Threshold
Campaign Exposure	2.36**	1.92	1.71*	1.26
*p<.05; **p<.01 Controls for education, age, income, and number of children				